Mineral Exploration and Mining Essentials
Contents

Preface ix
Meet the Author xiii

CHAPTER 1—INDUSTRY OVERVIEW 1
  The Mining Life Sequence 2
  Mineral Exploration and Mining 4
  Commodities 7
  Participants in Exploration and Mining 9
  Funding Mineral Exploration 12
  References 13

CHAPTER 2—GEOLOGY 15
  Plate Tectonics 16
  Geologic Time 21
  Minerals 23
  Rocks 28
  Structural Geology 37
  References 45

CHAPTER 3—MINERAL DEPOSITS 47
  The Formation of Mineral Deposits 48
  Mineral Deposit Terminology 55
  Styles and Forms of Mineralization 58
  Mineral Deposit Types 63
  References 108

CHAPTER 4—MINERAL EXPLORATION 113
  Stages of Exploration and Types of Exploration Properties 114
  Option Agreements 125
  Joint Ventures and Exploration Alliances 129
  Exploration Targets 130
  Mineral Exploration Techniques 130
  Geological Methods 138
  Geochemical Methods 140
  Geophysical Methods 151
  Drilling Methods 158
  References 167
The Mineral Exploration and Mining Industry

The mineral exploration and mining industry is a dynamic, high-tech and diverse sector that is vital to our modern world. It combines science and engineering with business and finance and it is fuelled by a drive for discovery. It is an industry requiring the expertise of a vast array of participants, where technical and business professionals work alongside entrepreneurs, risk takers and creative thinkers to discover, develop, operate and decommission mines. The mining industry is a primary wealth creation industry. It provides the raw products needed for almost all other sectors and it supports the economic development of countries and communities across the globe. The mining industry continuously strives to operate more efficiently and to limit its impact on the environment, while supporting the economic and social development of communities and countries. As we move toward a more sustainable way of life on Earth, the products of the mining industry will continue to play a vital role in the development of emerging industries such as renewable energy technologies. The mining industry is not an industry of the past; it is an industry crucial to the present and the future. It is exciting to participate in and to learn about.

This book is aimed at non-technical individuals and professionals who are working, or interested, in the mineral exploration and mining industry. It will also be of benefit to students, investors, community leaders, regulators and the general public. The book provides an overview of the industry from exploration to mine closure and should serve as a valuable reference that can be reviewed and re-read over time. It is hoped that the book will lead to more informed business and investment decisions, will assist with the advancement of professional careers, and will support the effective review and evaluation of mineral development proposals by financiers, governments and communities.

Organization

The book is divided into nine chapters that more or less follow the typical path of a mining project from exploration through mine development, operation and closure. Each chapter stands alone, but a broader appreciation of the mining industry, as presented in the book, will be enhanced by reviewing each chapter sequentially. Chapter 1 provides an overview of the mineral exploration and mining industry in a global context, introduces the participants in the industry and discusses the sources of funding. Chapters 2 and 3 provide a brief review of geology and mineral deposits. Because the mineral exploration and mining industry is built around evaluating and extracting rocks and
mineral deposits, it is important to have a basic understanding of these technical topics. Where possible, the linkages between basic geology and mineral exploration or mining applications have been highlighted. Chapter 3 also includes a survey of 10 common mineral deposit types that will serve as a valuable reference. Chapter 4 discusses mineral exploration and includes business aspects such as option agreements and technical aspects such as geochemical and geophysical surveys and drilling methods. Chapter 5 covers topics that represent the transition from mineral exploration to mining, including mineral resource and reserve estimates and feasibility studies. It also includes a review of Canada’s national securities instrument 43-101 (NI43-101). Chapters 6 and 7 discuss mining and mineral processing and review both surface and underground mining and the recovery of precious and base metals. Chapter 8 touches on a number of environmental considerations that are important to the industry such as sustainable development, environmental assessment, and closure and reclamation. Chapter 9 outlines some of the factors that should be considered when evaluating exploration companies and technical news releases, particularly from an investment point of view.

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